

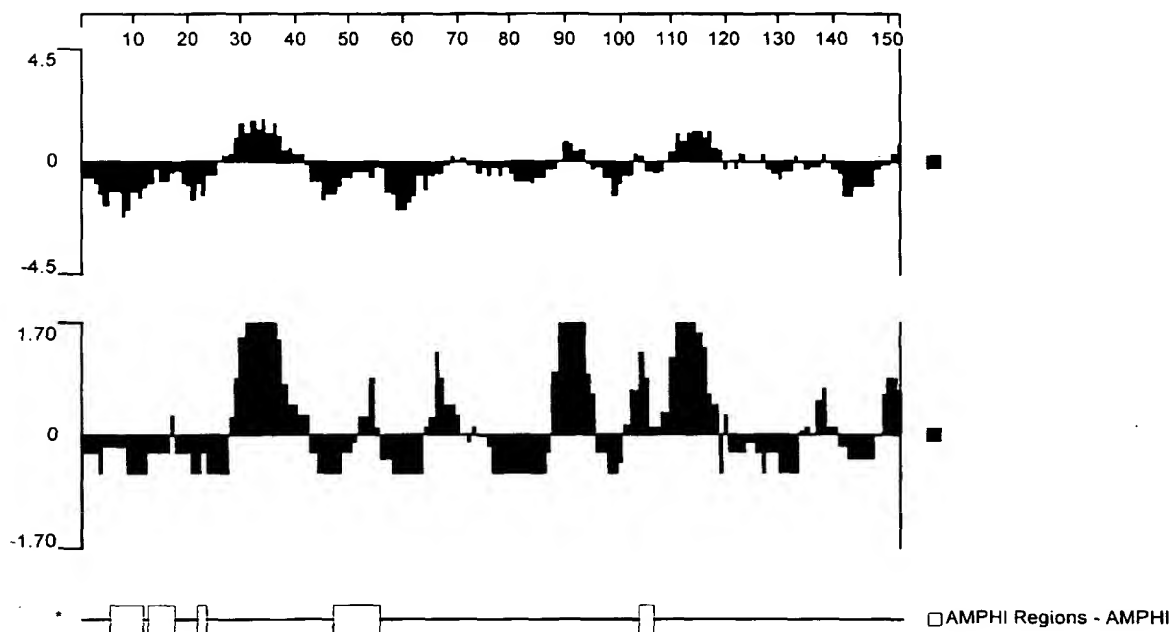
279Hydrophilicity Plot, Antigenic Index and AMPHI Regions

Fig. 11

**576-1**  
**Hydrophilicity Plot, Antigenic Index and AMPHI Regions**

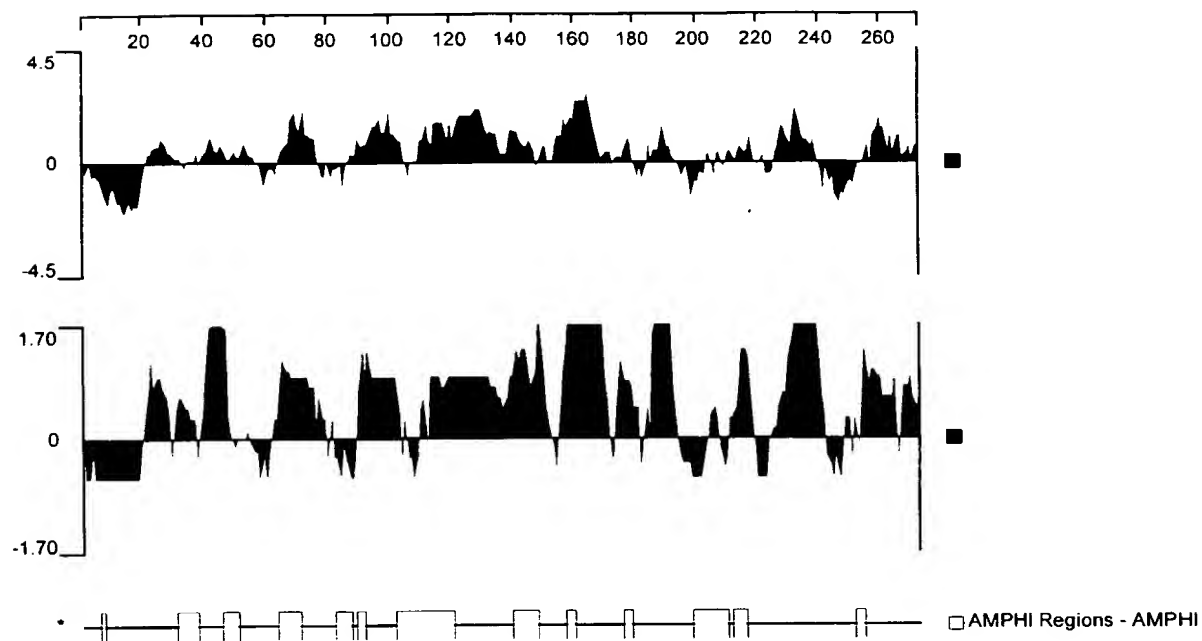


Fig. 12

**519-1**  
**Hydrophilicity Plot, Antigenic Index and AMPHI Regions**

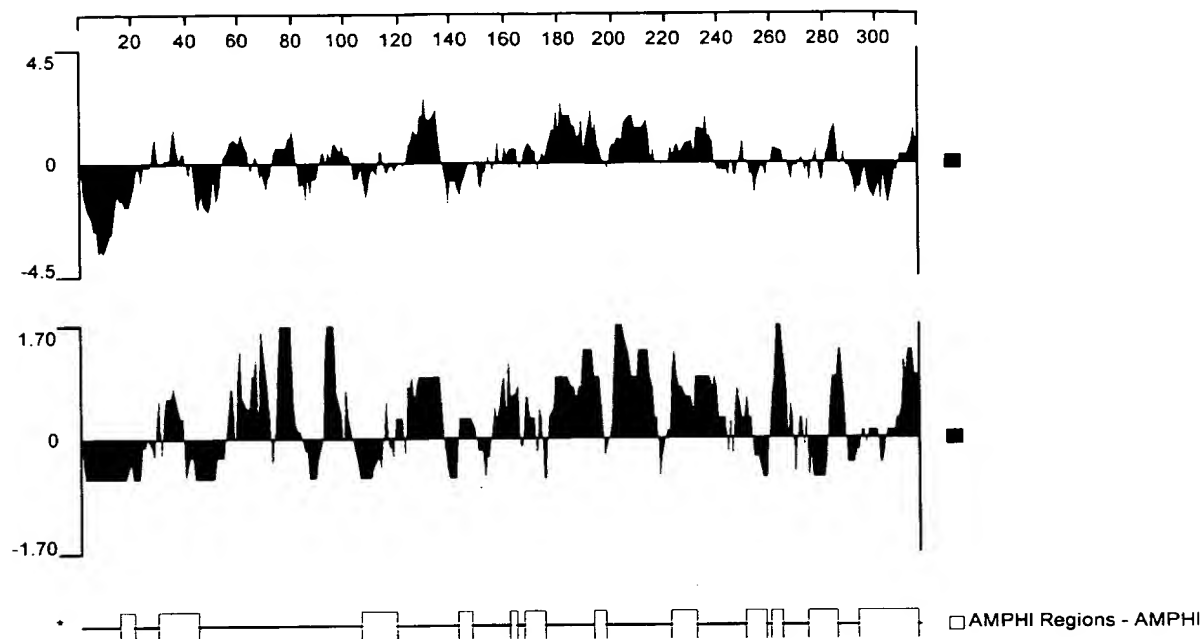


Fig. 13

**121-1**  
**Hydrophilicity Plot, Antigenic Index and AMPHI Regions**

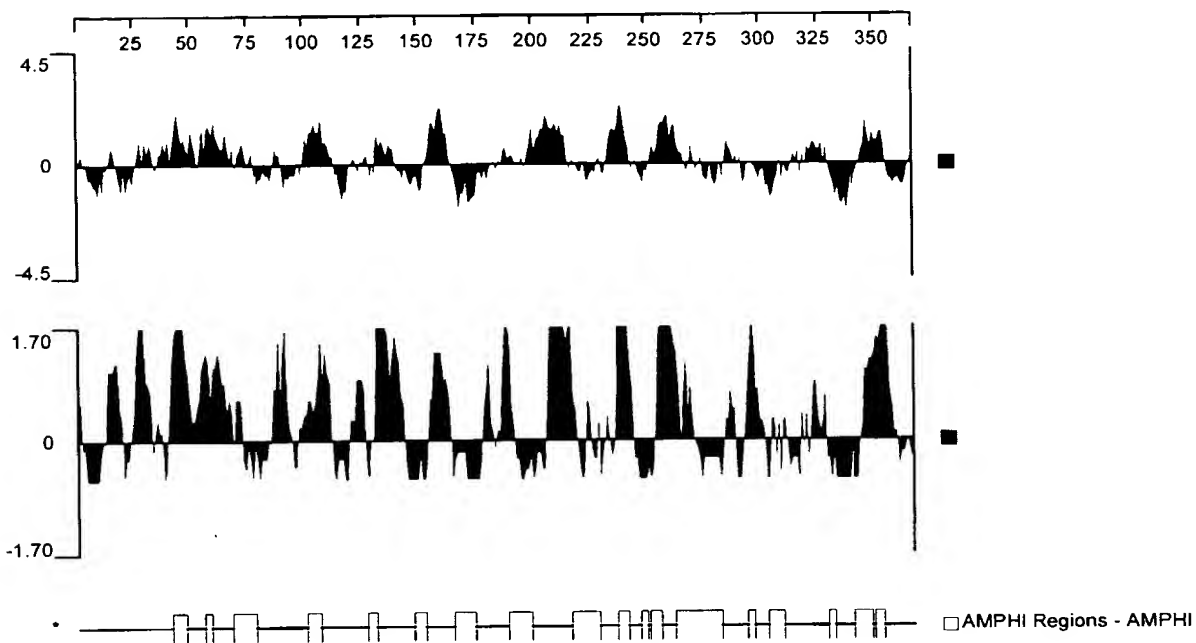


Fig. 14

**128-1**  
**Hydrophilicity Plot, Antigenic Index and AMPHI Regions**

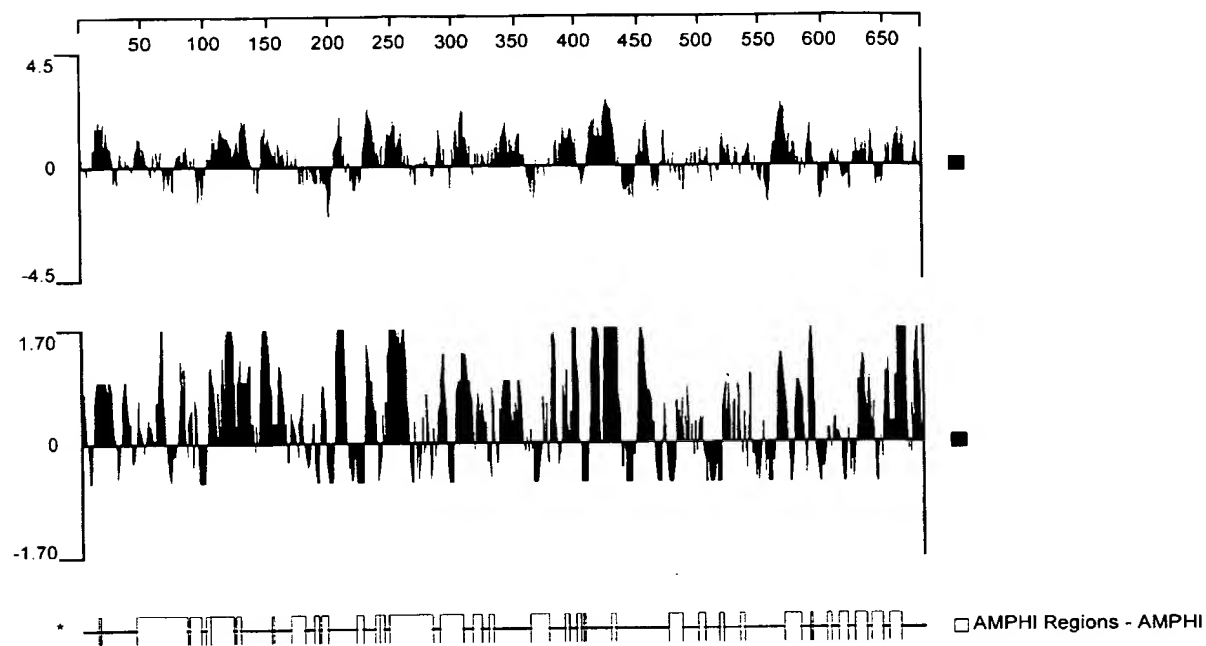


Fig. 15

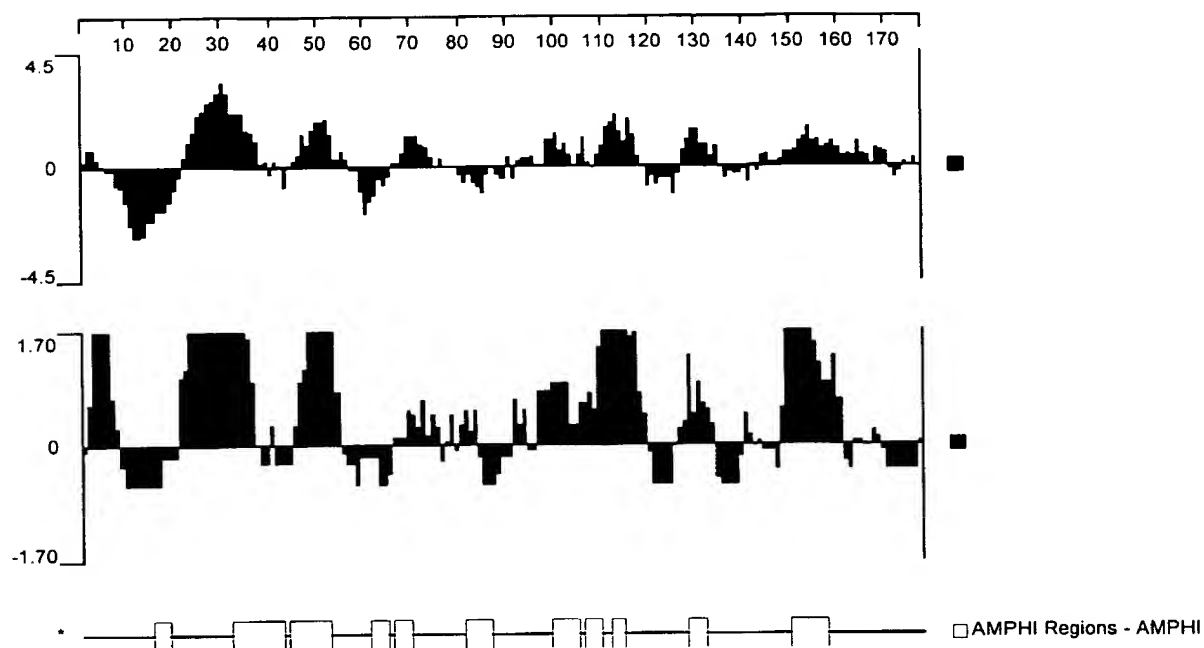
**206****Hydrophilicity Plot, Antigenic Index and AMPHI Regions**

Fig. 16

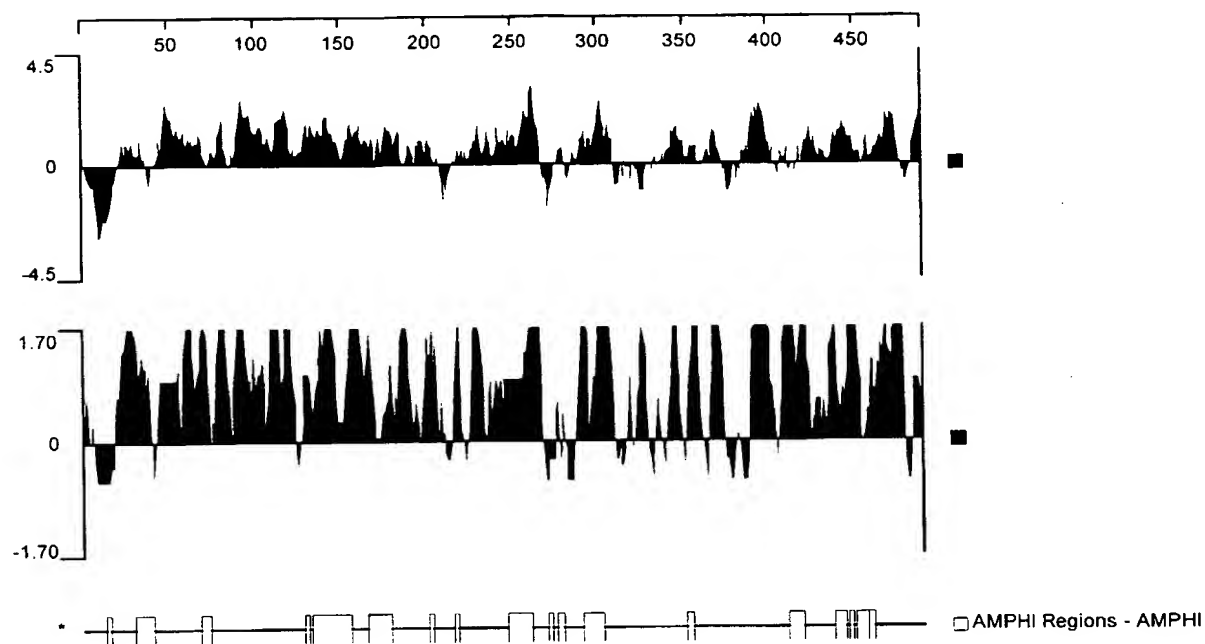
287Hydrophilicity Plot, Antigenic Index and AMPHI Regions

Fig. 17

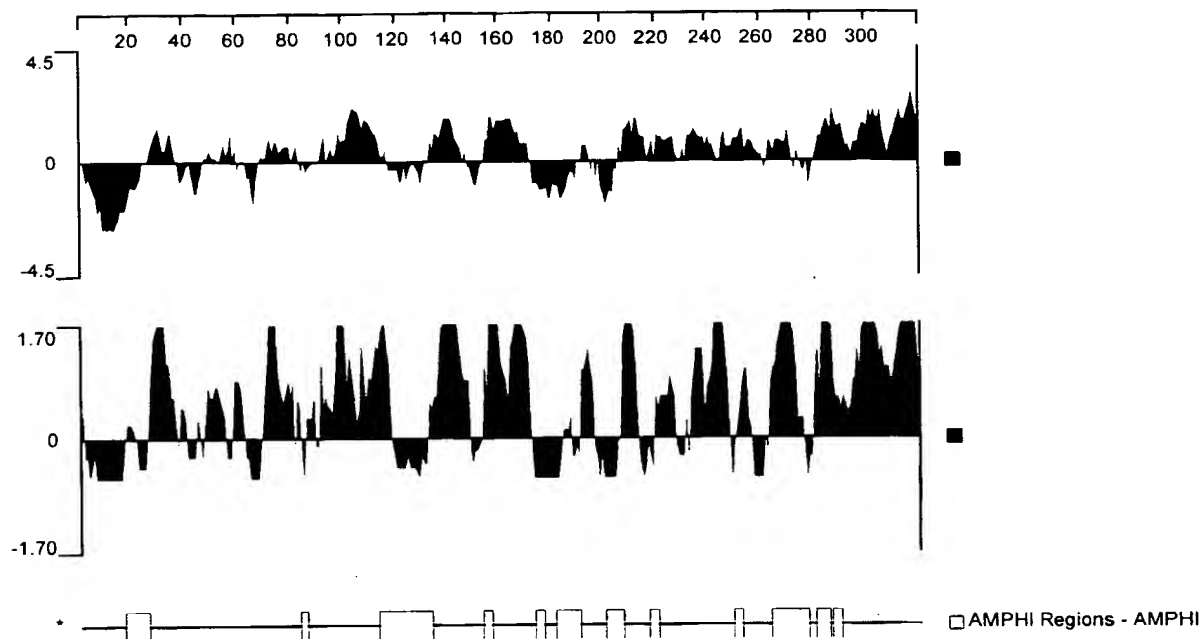
**406****Hydrophilicity Plot, Antigenic Index and AMPHI Regions**

Fig. 18



zo05_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo08_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
z2491	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo11_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo20_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo01_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo09_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo12_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo22_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo23_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo24_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo25_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo26_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo96_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo02_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo04_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo06_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo07_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo10_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo14_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo16_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo17_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo18_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo19_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo21_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo27_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo28_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo29_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo13_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo03_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo15_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
fa1090	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo32_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	
zo33_225	1	MDSFFKPAVWAVLWLMFAVRPALADELTNLLSSREQILRQFAEDEQPVLPINRAPARRAG	

zo05_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo08_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
z2491	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo11_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo20_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo01_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo09_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo12_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo22_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo23_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo24_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo25_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo26_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo96_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo02_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo04_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo06_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo07_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo10_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo14_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo16_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo17_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo18_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo19_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo21_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo27_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo28_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo29_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo13_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo03_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo15_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
fa1090	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo32_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA
zo33_225	61	NADELIGSAMGLNE	QPVLVPVNRVPARRAGNA

FIG. 19A

**SUBSTITUTE SHEET (RULE 26)**

zo05_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo08_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
z2491	241	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo11_225	241	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo20_225	241	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo01_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo09_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo12_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo22_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo23_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo24_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo25_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo26_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo96_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo02_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo04_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo06_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo07_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo10_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo14_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo16_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo17_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo18_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo19_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo21_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo27_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo28_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo29_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo13_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo03_225	212	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo15_225	183	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
fa1090	183	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo32_225	183	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*
zo33_225	183	IHAPRTGKNIEITSLSHKYWSGKYAFARRVKKNDPSRFLN*

Fig. 19C

**FIG. 20A**

gnmzq09	121	YQILDSVTTVSAKARLVDSRNGKVLWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq31	121	YQILDSVTTVSAKARLVDSRNGKVLWSGSASIREGSNNSNSGLLGALVGAVVNQIANSLT
fa1090	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVGAVVNQIANSLT
gnmzq32	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVGAVVNQIANSLT
gnmzq33	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVGAVVNQIANSLT
gnmzq01	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq05	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq08	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq02	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq03	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq04	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq07	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq10	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq11	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq13	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq15	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq16	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq17	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq19	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq21	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq22	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq23	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq24	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq25	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq27	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq28	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq29	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
z2491	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq14	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq18	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq26	121	YQILDSVTTVSAKARLVDSRNGKELWSGSASIREGSNNSNSGLLGALVSAVVNQIANSLT
gnmzq09	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq31	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
fa1090	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq32	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq33	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq01	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq05	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq08	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq02	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq03	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq04	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq07	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq10	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq11	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq13	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq15	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq16	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq17	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq19	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq21	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq22	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq23	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq24	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq25	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq27	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq28	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq29	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
z2491	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq14	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq18	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*
gnmzq26	181	DRGYQVSKTAAYNLLSPYSHNGILKGPRFVEEQPK*

FIG. 20B

```

287_14 1 MFKRSVIAMACIFALSACGGGGGGSPDVKSADTLSKPAAPVVSE.....KETEA
287_2 1 MFKRSVIAMACIFALSACGGGGGGSPDVKSADTLSKPAAPVVSE.....KETEA
287_21 1 MFKRSVIAMACIFALSACGGGGGGSPDVKSADTLSKPAAPVVSE.....KETEA
z2491 1 MFKRSVIAMACIFALSACGGGGGGSPDVKSADTLSKPAAPVVSE.....KETEA
287_9 1 MFKRSVIAMACIFALSACGGGGGGSPDVKSADTLSKPAAPVVSE.....KETEA
fa1090 1 MFKRSVIAMACIFALSACGGGGGGSPDVKSADTLSKPAAPVVSE.....KETEA

287_14 50 KEDAPQAGSQGQGAPSAQGGQDMAAVSEENTGNGGAAATDKPKNEDEGAQNDMPQNAADT
287_2 50 KEDAPQAGSQGQGAPSAQGGQDMAAVSEENTGNGGAAATDKPKNEDEGAQNDMPQNAADT
287_21 50 KEDAPQAGSQGQGAPSAQGGQDMAAVSEENTGNGGAAATDKPKNEDEGAQNDMPQNAADT
z2491 50 KEDAPQAGSQGQGAPSAQGGQDMAAVSEENTGNGGAAATDKPKNEDEGAQNDMPQNAADT
287_9 61 VSGAPQADT...QDATAGKGGQDMAAVSAENTGNGGAATTDNPKNEDEGAQNDMPQNAADT
fa1090 61 AGGAPQADT...QDATAGKGGQDMAAVSAENTGNGGAATTDNPKNEDEGAQNDMPQNAADT

287_14 110 DSLTPNHTPASNMPAGNMENQAPDAGESEOPANQPDMAANTADGMQGGDDPSAGGENAGNTA
287_2 110 DSLTPNHTPASNMPAGNMENQAPDAGESEOPANQPDMAANTADGMQGGDDPSAGGENAGNTA
287_21 110 DSLTPNHTPASNMPAGNMENQAPDAGESEOPANQPDMAANTADGMQGGDDPSAGGENAGNTA
z2491 110 DSLTPNHTPASNMPAGNMENQAPDAGESEOPANQPDMAANTADGMQGGDDPSAGGENAGNTA
287_9 119 DSLTPNHTPASNMPAGNMENQAPDAGESEOPANQPDMAANTADGMQGGDDPSAGGENAGNTA
fa1090 117 DSLTPNHTPASNMPAGNMENQAPDAGESEOPANQPDMAANTADGMQGGDDPSAGGENAGNTA

287_14 170 AOGTNOAENNOQTAGSQNPASSINPSATNSGGDFGRTNVGNSSVVIDGPSQNTITLTHCKGDS
287_2 170 AOGTNOAENNOQTAGSQNPASSINPSATNSGGDFGRTNVGNSSVVIDGPSQNTITLTHCKGDS
287_21 170 AOGTNOAENNOQTAGSQNPASSINPSATNSGGDFGRTNVGNSSVVIDGPSQNTITLTHCKGDS
z2491 170 AOGTNOAENNOQTAGSQNPASSINPSATNSGGDFGRTNVGNSSVVIDGPSQNTITLTHCKGDS
287_9 178 DQANQAENNOQTAGSQNPASSINPSATNSGGDFGRTNVGNSSVVIDGPSQNTITLTHCKGDS
fa1090 117 .ESANQTNNOQTAGSQNPASSINPSATNSGGDFGRTNVGNSSVVIDGPSQNTITLTHCKGDS

287_14 230 CSGNNFLDEEVQLKSEFEKLSDADKISNYKKDGKNDGKNDKFVGLVADSVQMKGINQYII
287_2 230 CSGNNFLDEEVQLKSEFEKLSDADKISNYKKDGKNDGKNDKFVGLVADSVQMKGINQYII
287_21 230 CSGNNFLDEEVQLKSEFEKLSDADKISNYKKDGKNDGKNDKFVGLVADSVQMKGINQYII
z2491 230 CSGNNFLDEEVQLKSEFEKLSDADKISNYKKDGKNDGKNDKFVGLVADSVQMKGINQYII
287_9 238 CDRD.FLDEEAPPKSEFEKLSDADKISNYKKDGKNDGKNDKFVGLVADSVQMKGINQYII
fa1090 176 CNGDNLLDEEAPPKSEFEKLSDADKISNYKKDGKNDGKNDKFVGLVADSVQMKGINQYII

287_14 290 FYKPKP...TSFARFRRSARSRRSLPAEMPLIPVNQADTLIVDGEAVSLTGHSNIFAPEG
287_2 290 FYKPKP...TSFARFRRSARSRRSLPAEMPLIPVNQADTLIVDGEAVSLTGHSNIFAPEG
287_21 286 FYKPKP...TSFARFRRSARSRRSLPAEMPLIPVNQADTLIVDGEAVSLTGHSNIFAPEG
z2491 286 FYKPKP...TSFARFRRSARSRRSLPAEMPLIPVNQADTLIVDGEAVSLTGHSNIFAPEG
287_9 293 IYKDKSASSSARFRRSARSRRSLPAEMPLIPVNQADTLIVDGEAVSLTGHSNIFAPEG
fa1090 232 FYTDKPPPT.....RSARSRRSLPAEMPLIPVNQADTLIVDGEAVSLTGHSNIFAPEG

287_14 348 NYRYLTYGAEKLPGGSYALRVQGEPSKGEMLAGTAVYNGEVLHFHTENGRPSPSRGRFAA
287_2 348 NYRYLTYGAEKLPGGSYALRVQGEPSKGEMLAGTAVYNGEVLHFHTENGRPSPSRGRFAA
287_21 344 NYRYLTYGAEKLPGGSYALRVQGEPSKGEMLAGTAVYNGEVLHFHTENGRPSPSRGRFAA
z2491 344 NYRYLTYGAEKLPGGSYALRVQGEPSKGEMLAGTAVYNGEVLHFHTENGRPSPSRGRFAA
287_9 353 NYRYLTYGAEKLPGGSYALRVQGEPSKGEMLAGTAVYNGEVLHFHTENGRPSPSRGRFAA
fa1090 285 NYRYLTYGAEKLPGGSYALRVQGEPSKGEMLAGTAVYNGEVLHFHTENGRPSPSRGRFAA

287_14 408 KVDFGSKSVDGIIDSGDLHMGTOQKFKAIDGNGFKGTWTENG GGDVSGKFYGPAGEEVA
287_2 408 KVDFGSKSVDGIIDSGDLHMGTOQKFKAIDGNGFKGTWTENG GGDVSGKFYGPAGEEVA
287_21 404 KVDFGSKSVDGIIDSGDLHMGTOQKFKAIDGNGFKGTWTENG GGDVSGKFYGPAGEEVA
z2491 404 KVDFGSKSVDGIIDSGDLHMGTOQKFKAIDGNGFKGTWTENG GGDVSGKFYGPAGEEVA
287_9 413 KVDFGSKSVDGIIDSGDLHMGTOQKFKAIDGNGFKGTWTENG GGDVSGKFYGPAGEEVA
fa1090 345 KVDFGSKSVDGIIDSGDLHMGTOQKFKAIDGNGFKGTWTENG GGDVSGKFYGPAGEEVA

```

FIG. 21A

287_14	468	GKYSYRPTDAEKGGFGVFAGKKEQD*
287_2	468	GKYSYRPTDAEKGGFGVFAGKKEQD*
287_21	464	GKYSYRPTDAEKGGFGVFAGKKEQD*
z2491	464	GKYSYRPTDAEKGGFGVFAGKKEQD*
287_9	473	GKYSYRPTDAEKGGFGVFAGKKEQD*
fa1090	405	GKYSYRPTDAEKGGFGVFAGKKERD*

FIG. 21B



[illegible]

```

z2491_519
zv26_519
zv22_519ass
fa1090_519
zv32_519
zv11_519
zv28_519
zv96_519
zv02_519
zv03_519
zv04_519
zv05_519
zv01_519
zv07_519
zv12_519
zv18_519
zv19_519
zv21_519ass
zv27_519
zv20_519ass
zv06_519ass
zv29_519ass

```

[illegible]

```

z2491_519
zv26_519
zv22_519ass
fa1090_519
zv32_519
zv11_519
zv28_519
zv96_519
zv02_519
zv03_519
zv04_519
zv05_519
zv01_519
zv07_519
zv12_519
zv18_519
zv19_519
zv21_519ass
zv27_519
zv20_519ass
zv06_519ass
zv29_519ass

```

[illegible]

**SUBSTITUTE SHEET (RULE 26)**



z2491_519	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv26_519	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv22_519ass	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
fa1090_519	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv32_519	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv11_519	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv28_519	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv96_519	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv02_519	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv03_519	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv04_519	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv05_519	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv01_519	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv07_519	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv12_519	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv18_519	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv19_519	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv21_519ass	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv27_519	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv20_519ass	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv06_519ass	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR
zv29_519ass	181	KRARIAESEGRKIEQINLASGQREAEIQQSEGEAQAAVNASNAEKIARINRAKGEAESLR

z2491_519	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv26_519	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv22_519ass	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
fa1090_519	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv32_519	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv11_519	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv28_519	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv96_519	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv02_519	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv03_519	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv04_519	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv05_519	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv01_519	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv07_519	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv12_519	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv18_519	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv19_519	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv21_519ass	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv27_519	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv20_519ass	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv06_519ass	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL
zv29_519ass	241	LVAEANAFAIRQIAAALQTQGGADAVNLKIAEQYVAAFNNLAKESNTLIMPANVADIGSL

z2491_519	301	ISAGMKIIDSSKTAK*
zv26_519	301	ISAGMKIIDSSKTAK*
zv22_519ass	301	ISAGMKIIDSSKTAK*
fa1090_519	301	ISAGMKIIDSSKTAK*
zv32_519	301	ISAGMKIIDSSKTAK*
zv11_519	301	ISAGMKIIDSSKTAK*
zv28_519	301	ISAGMKIIDSSKTAK*
zv96_519	301	ISAGMKIIDSSKTAK*
zv02_519	301	ISAGMKIIDSSKTAK*
zv03_519	301	ISAGMKIIDSSKTAK*
zv04_519	301	ISAGMKIIDSSKTAK*
zv05_519	301	ISAGMKIIDSSKTAK*
zv01_519	301	ISAGMKIIDSSKTAK*
zv07_519	301	ISAGMKIIDSSKTAK*
zv12_519	301	ISAGMKIIDSSKTAK*
zv18_519	301	ISAGMKIIDSSKTAK*
zv19_519	301	ISAGMKIIDSSKTAK*
zv21_519ass	301	ISAGMKIIDSSKTAK*
zv27_519	301	ISAGMKIIDSSKTAK*
zv20_519ass	301	ISAGMKIIDSSKTAK*
zv06_519ass	301	ISAGMKIIDSSKTAK*
zv29_519ass	301	ISAGMKIIDSSKTAK*

FIG. 22B

**FIG. 23A**





fa1090	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm33asbc	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm32asbc	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm23asbc	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm27bc	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm09	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm10	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm24	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm25	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm14	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm04	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm11asbc	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm08n	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm96	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm01	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm02	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm03	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm07	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm12	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm18	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm19	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm20	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm21	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm06	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm17	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm13	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm05	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
z2491	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm22	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm26	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm28	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm29asbc	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm16	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm15	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
zm31asbc	361	VDRHYITLGAPLFVATAHPVTRKALNRLIMAQDTGSAIKGAVRVDYFWGYGDEAGELAGK
fa1090	421	QKTTGYVWQLLPNGMKPEYRP*
zm33asbc	421	QKTTGYVWQLLPNGMKPEYRP*
zm32asbc	421	QKTTGYVWQLLPNGMKPEYRP*
zm23asbc	421	MKEPFGYVWQLLPNGMKPEYRP*
zm27bc	421	MKEPFGYVWQLLPNGMKPEYRP*
zm09	421	QKTTGYVWQLLPNGMKPEYRP*
zm10	421	QKTTGYVWQLLPNGMKPEYRP*
zm24	421	QKTTGYVWQLLPNGMKPEYRP*
zm25	421	QKTTGYVWQLLPNGMKPEYRP*
zm14	421	QKTTGYVWQLLPNGMKPEYRP*
zm04	421	QKTTGYVWQLLPNGMKPEYRP*
zm11asbc	421	QKTTGYVWQLLPNGMKPEYRP*
zm08n	421	QKTTGYVWQLLPNGMKPEYRP*
zm96	421	QKTTGYVWQLLPNGMKPEYRP*
zm01	421	QKTTGYVWQLLPNGMKPEYRP*
zm02	421	QKTTGYVWQLLPNGMKPEYRP*
zm03	421	QKTTGYVWQLLPNGMKPEYRP*
zm07	421	QKTTGYVWQLLPNGMKPEYRP*
zm12	421	QKTTGYVWQLLPNGMKPEYRP*
zm18	421	QKTTGYVWQLLPNGMKPEYRP*
zm19	421	QKTTGYVWQLLPNGMKPEYRP*
zm20	421	QKTTGYVWQLLPNGMKPEYRP*
zm21	421	QKTTGYVWQLLPNGMKPEYRP*
zm06	421	QKTTGYVWQLLPNGMKPEYRP*
zm17	421	QKTTGYVWQLLPNGMKPEYRP*
zm13	421	QKTTGYVWQLLPNGMKPEYRP*
zm05	421	QKTTGYVWQLLPNGMKPEYRP*
z2491	421	QKTTGYVWQLLPNGMKPEYRP*
zm22	421	QKTTGYVWQLLPNGMKPEYRP*
zm26	421	QKTTGYVWQLLPNGMKPEYRP*
zm28	421	QKTTGYVWQLLPNGMKPEYRP*
zm29asbc	421	QKTTGYVWQLLPNGMKPEYRP*
zm16	421	QKTTGYVWQLLPNGMKPEYRP*
zm15	421	QKTTGYVWQLLPNGMKPEYRP*
zm31asbc	421	QKTTGYVWQLLPNGMKPEYRP*

FIG. 23D

# INTERNATIONAL SEARCH REPORT

Int. Patent Application No.  
PCT/99/09346

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 6 C12N15/31 C07K14/22 C07K16/12 C12Q1/68 A61K39/095  
G01N33/50

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 C12N C07K C12Q A61K G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE TREMBL [Online] EMBL ID Q55666, AC Q55666, 1 November 1996 (1996-11-01) TABATA S: "Membrane-bound lytic transglycosylase A MltA Synechocystis sp. strain PCC 6803" XP002130156 Note: 100% aa seq identity of aa 342-350 with aa 392-400 of SEQ ID NOs 2790 and 2792, 27.6% (26.9%) aa seq identity with SEQ ID NO:2790 (2792) in 370 (387) aa overlap. the whole document</p> <p style="text-align: center;">--- -/-</p>	1,4-6,9, 12

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

26 May 2000

Date of mailing of the international search report

15.06.00

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

van de Kamp, M

## INTERNATIONAL SEARCH REPORT

In Application No  
99/09346

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 818 465 A (BIOLOG MOLECULAIRE DES PLANTES ; INST OF MOLECULAR BIOTECHNOLOG (DE) 14 January 1998 (1998-01-14) Note: 100% nt seq identity of nt 367951-367961 of SEQ ID NO:1 with nt 163-173 of SEQ ID NO:2789. page 108	8,11,12
A	LOMMATZSCH J ET AL.: "Outer membrane localization of murein hydrolases: MltA, a third lipoprotein lytic transglycosylase in Escherichia coli" JOURNAL OF BACTERIOLOGY, vol. 179, no. 17, September 1997 (1997-09), pages 5465-5470, XP002130154 Note: 33.7% (35.7%) aa seq identity with SEQ ID NO:2790 (2792) in 273 (207) aa overlap. abstract	1-12
A	DILLARD J P ET AL.: "A peptidoglycan hydrolase similar to bacteriophage endolysins acts as an autolysin in Neisseria gonorrhoeae" MOLECULAR MICROBIOLOGY, vol. 25, no. 5, September 1997 (1997-09), pages 893-901, XP000878964 abstract	1-12
A	WO 96 29412 A (IAF BIO VAC INC ; BRODEUR BERNARD R (CA); MARTIN DENIS (CA); HAMEL) 26 September 1996 (1996-09-26) cited in the application the whole document examples 1-12	1-18
A	WO 94 08013 A (OREGON STATE) 14 April 1994 (1994-04-14) the whole document examples 1-7	1-18
A	WO 92 13871 A (UNIV WASHINGTON) 20 August 1992 (1992-08-20) the whole document examples 1-10	1-18
A	BLAKE M S ET AL.: "Vaccines for gonorrhoea: where are we on the curve?" TRENDS IN MICROBIOLOGY, vol. 3, no. 12, December 1995 (1995-12), pages 469-474, XP000876514 the whole document	1-18
	---	
	-/--	



## INTERNATIONAL SEARCH REPORT

International Application No

PCT 99/09346

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	POOLMAN J T: "Development of a meningococcal vaccine" INFECTIOUS AGENTS AND DISEASE, vol. 4, no. 1, March 1995 (1995-03), pages 13-28, XP000876540 the whole document	1-18
X	WO 96 01901 A (RHONE POULENC RORER SA ;BLANC VERONIQUE (FR); THIBAUT DENIS (FR);) 25 January 1996 (1996-01-25) Note: 100% nt seq ident of bp 170-156 of SEQ ID NO:1 (rev DNA) with bp 202-216 of SEQ ID NO:1 (61.2% in 348 bp overlap), 40.7% seq ident of transl SEQ ID NO:1 with SEQ ID NO:2 in 118 aa overlap. page 102-104 example 1	8,11,12
X	WO 97 37044 A (ASTRA AB ;ALM RICHARD A (US); SMITH DOUGLAS (US)) 9 October 1997 (1997-10-09) Note: 100% aa seq identity of aa 204-211, 186-193 & 352-359 of transl SEQ ID NOs 227, 345 & 1003, resp., with aa 59-66 of SEQ ID NO:2, 37.4% aa seq identity with SEQ ID NO:2 in 115 aa overlap. page 268-269 page 344 page 909-910 page 23, paragraph B.4	4,12-14
X	DATABASE SWISSPROT [Online] ID YPCP YEREN, AC P31485, 1 July 1993 (1993-07-01) BAEUMLER A J ET AL.: "Hypothetical 29.6 kD protein in PCP 5' region (ORF1)" XP002138650 Note: 100% aa seq identity of aa 148-159 with aa 140-151 of SEQ ID NO:442, 43.4% aa seq identity with SEQ ID NO:442 in 256 aa overlap. the whole document	4,12
A	-& BAUMLER A J ET AL.: "A lipoprotein of Yersinia enterocolitica facilitates ferrioxamine uptake in Escherichia coli" JOURNAL OF BACTERIOLOGY, vol. 174, no. 3, February 1992 (1992-02), pages 1029-1035, XP000907295 page 1031, left-hand column, line 11 -right-hand column, line 15	4,12

-/--



## INTERNATIONAL SEARCH REPORT

In: International Application No

PCT 99/09346

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE SWISSPROT [Online]  ID YDHH HAEIN, AC P44861,  1 November 1995 (1995-11-01)  FLEISCHMANN R D ET AL.: "Hypothetical  protein HI0753"  XP002138651  Note: 100% aa seq identity of aa 143-156  with aa 140-153 of SEQ ID NO:442, 41.6% aa  seq identity with SEQ ID NO:442 in 377 aa  overlap.  the whole document</p>	4,12
X	<p>WO 96 33276 A (HUMAN GENOME SCIENCES INC  ;UNIV JOHNS HOPKINS (US))  24 October 1996 (1996-10-24)  Note: 100% nt seq identity of bp  816794-816807 with bp 289-302 of SEQ ID  NO:441 (54.3% in 484 bp overlap), 100% aa  seq identity of translated sequence with  SEQ ID NO:442 in 14 aa overlap.  page 77.488  Note: 100% nt seq identity of bp  230516-230526 with bp 1501-1511 of SEQ ID  NO:489 (57.4% in 1292 bp overlap), 100% aa  seq identity of translated sequence with  SEQ ID NO:490 in 13 aa overlap.  page 77.139  page 76.37, line HI0215  Note: 100% nt seq identity of bp  1025409-1025418 with bp 1339-1330 (rev  strand) of SEQ ID NO:1201 (72.0% in 50 bp  overlap).  page 77.612</p>	4,8, 11-14
X	<p>CONLIN C A ET AL.: "Escherichia coli prlC  encodes an endopeptidase and is homologous  to the Salmonella typhimurium opdA gene"  JOURNAL OF BACTERIOLOGY,  vol. 174, no. 18,  September 1992 (1992-09), pages 5881-5997,  XP000907300  Note: 100% nt seq ident of bp 1824-1837  with bp 1480-1493 of SEQ ID NO:489 (59.7%  in 1282 bp overlap), 100% aa seq ident of  aa 495-507 with aa 492-504 of SEQ ID  NO:490 (49.5% in 679 aa overlap).  abstract  figure 2</p>	4,8,11, 12

-/--

## INTERNATIONAL SEARCH REPORT

International Application No.

99/09346

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE SWISSPROT [Online]  ID OPDA HAEIN, AC P44573,  1 November 1995 (1995-11-01)  FLEISCHMANN R D ET AL.: "Oligopeptidase A  (EC 3.4.24.70)"  XP002138652  Note: 100% aa seq identity of aa 496-508  with aa 492-504 of SEQ ID NO:490, 49.0% aa  seq identity in 677 aa overlap.  the whole document</p>	4,12
X	<p>ROKBI B ET AL.: "Evaluation of  recombinant transferrin - binding protein  B variants from Neisseria meningitidis for  their ability to induce cross-reactive and  bactericidal antibodies against a  genetically diverse collection of  serogroup B strains."  INFECTION AND IMMUNITY,  vol. 65, no. 1, January 1997 (1997-01),  pages 55-63, XP002138643  abstract</p>	5
P,A	<p>DATABASE TREMBL [Online]  EMBL  ID 069750, AC 069750,  1 August 1998 (1998-08-01)  ROKBI B ET AL.: "Transferrin binding  protein B, TbpB, Neisseria meningitidis"  XP002138653  Note: 22.3% aa seq identity with SEQ ID  NO:1202 in 488 aa overlap.  the whole document</p>	4,8, 12-15,17
A	<p>-&amp; ROKBI B ET AL.: "Heterogeneity of  tbpB, the transferrin-binding protein B  gene, among serogroup B Neisseria  meningitidis strains of the ET-5 complex"  CLINICAL AND DIAGNOSTIC LABORATORY  IMMUNOLOGY,  vol. 4, no. 5, September 1997 (1997-09),  pages 522-529, XP002138644  abstract</p>	5,8, 12-15,17

-/--

## INTERNATIONAL SEARCH REPORT

International Application No.

99/09346

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>DATABASE GCG_GENESSEQ [Online]  ID W14640, AC W14640,  5 March 1998 (1998-03-05)  QUENTIN-MILLET M J ET AL.: "N.  meningitidis HTR Tbp2 (del3777-385,  del407-465, del488-508)"  XP002138654  Note: 23.5% aa seq identity with SEQ ID  NO:1202 in 571 aa overlap.  the whole document</p>	4,8, 12-15,17
A	<p>-&amp; WO 97 13860 A (PASTEUR MERIEUX SERUMS  VACC; QUENTIN MILLET MARIE JOSE (FR);  ROKBI)) 17 April 1997 (1997-04-17)  claim 11</p>	4,8, 12-15,17
X	<p>---  DATABASE EMPR01 [Online]  EMBL  ID AF034831, AC AF034831,  4 December 1997 (1997-12-04)  YOU Z ET AL.: "Rhizobium etli stomatin  like protein (slp) gene, complete cds."  XP002138655  Note: 100% nt seq ident of bp 4384-4395  with bp 529-540 of SEQ ID NO:1455 (54.4%  in 638 bp overlap), 100% aa seq ident of  aa 1394-1403 with aa 109-118 of SEQ ID  NO:1456 (41.2% in 182 aa overlap).  the whole document</p>	4,8,11, 12
P,X	<p>-&amp; YOU Z ET AL.: "A stomatin-like protein  encoded by the slp gene of Rhizobium etli  is required for nodulation competitiveness  on the common bean"  MICROBIOLOGY,  vol. 144, no. 9, September 1998 (1998-09),  pages 2619-2627, XP000907294  abstract  figure 2</p>	4,8,11, 12
X	<p>---  HUANG M ET AL.: "A stomatin-like protein  necessary for mechanosensation in C.  elegans"  NATURE,  vol. 378, no. 6554,  16 November 1995 (1995-11-16), pages  292-295, XP002138646  Note: 100% aa seq identity of aa 233-239  with aa 110-117 of SEQ ID NO:1456, 29.9%  aa seq identity in 234 aa overlap.  abstract  figure 1</p> <p style="text-align: center;">---</p> <p style="text-align: center;">-/--</p>	4,12

## INTERNATIONAL SEARCH REPORT

 Int. Application No  
 Pub. No. 99/09346

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>WONG C Y ET AL.: "Cloning and characterization of two immunophilin-like genes, ilpA and fkpA, on a single 3.9-kilobase fragment of <i>Aeromonas hydrophila</i> genomic DNA" JOURNAL OF BACTERIOLOGY, vol. 179, no. 11, June 1997 (1997-06), pages 3397-3403, XP002138647</p> <p>Note: 100% nt seq ident of bp 2659-2672 with bp 613-626 of SEQ ID NO:1745 (59.2% in 655 bp overlap), 100% aa seq ident of aa 205-216 with aa 200-211 of SEQ ID NO:1746 (44.9% in 265 aa overlap).</p> <p>abstract figure 2</p>	4,8, 11-14
X	<p>--- DATABASE EMPRO2 [Online] EMBL ID NE01198, AC U001198, 23 November 1993 (1993-11-23) MCALLISTER C F ET AL.: "Neisseria elongata NRL FKBP immunophilin homolog gene" XP002138656</p> <p>Note: 100% nt seq identity of bp 125-138 with bp 635-648 of SEQ ID NO:1745 (65.8% nt seq identity in 237 bp overlap).</p> <p>the whole document</p>	8,11,12
X	<p>-&amp; MCALLISTER C F ET AL.: "Analysis in <i>Neisseria meningitidis</i> and other <i>Neisseria</i> species homologous to the FKBP immunophilin family" MOLECULAR MICROBIOLOGY, vol. 10, no. 1, October 1993 (1993-10), pages 13-23, XP000907304</p> <p>abstract figure 3</p>	8,11,12
X	<p>--- SAMPSON B A ET AL.: "Neisseria meningitidis encodes an FK506-inhibitable rotamase" PROC. NAT'L. ACAD. SCI. USA, vol. 89, no. 4, 15 February 1992 (1992-02-15), pages 1164-1168, XP002138648</p> <p>Note: 100% nt seq identity of bp 278-288 (284-294) with bp 719-729 of SEQ ID NO:1745 (60.5% nt seq identity in 281 bp overlap).</p> <p>abstract figure 2</p> <p>--- -/--</p>	8,11,12

## INTERNATIONAL SEARCH REPORT

International Application No.  
PCT/99/09346

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	HACKER J ET AL.: "Immunophilins: structure-function relationship and possible role in microbial pathogenicity." MOLECULAR MICROBIOLOGY, vol. 10, no. 3, November 1993 (1993-11), pages 445-456, XP000907321 abstract	13,14,17
X	--- DATABASE EMPRI [Online] EMBL ID ECUW93, AC U14003 (partial), 30 November 1994 (1994-11-30) BURLAND V ET AL.: "Escherichia coli K-12 chromosomal region from 92.8 to 00.1 minutes" XP002138657 Note: 100% nt seq identity of bp 37827-37839 with bp 1186-1174 of SEQ ID NO:2791. page 4 -----	8,11,12

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

Invention 1. Claims: 1,3,16,18 (all completely); 2,4-15,17 (all partially)

A protein comprising the amino sequence of SEQ ID NO:2790 or comprising a fragment of at least 7 (preferably consecutive) amino acids of said SEQ ID NO; a protein with 50% or greater homology to said protein(s); an antibody binding to said protein(s); a nucleic acid encoding said protein(s), preferably comprising the nucleotide sequence of SEQ ID NO:2789 or a fragment comprising 10 or more consecutive nucleotides thereof; complementary nucleic acid molecules; compositions comprising said protein(s), nucleic acid(s) or antibody for vaccination, diagnosis or pharmaceutical use, preferably immunogenic compositions comprising said protein(s), and the use of said composition(s).

Invention 2. Claims: 2,4-15,17 (all partially)

A protein comprising an amino sequence according to SEQ ID NO:2 or comprising a fragment of at least 7 consecutive amino acids of said SEQ ID NO; an antibody binding to said protein(s); a nucleic acid encoding said protein(s), preferably comprising a nucleotide sequence according to SEQ ID NO:1 or a fragment comprising 10 or more consecutive nucleotides thereof; complementary nucleic acid molecules; compositions comprising said protein(s), nucleic acid(s) or antibody for vaccination, diagnosis or pharmaceutical use, preferably immunogenic compositions comprising said protein(s), and the use of said composition(s).

Inventions 3-1510. Claims: 2,4,-15,17 (all partially)

Same as invention 2 but for proteins limited to the even-numbered SEQ ID NOs:4-3020 except 2790, and for nucleic acids limited to the corresponding odd-numbered SEQ ID NOs:3-3019 except 2789. E.g., invention 3: limited to SEQ ID NO:4 and SEQ ID NO:3, invention 4: limited to SEQ ID NO:6 and SEQ ID NO:5, ... , invention 1509: limited to SEQ ID NO:3018 and SEQ ID NO:3017, and invention 1510: limited to SEQ ID NO:3020 and SEQ ID NO:3019.

**Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)**

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:  
1,3,16,18 (all completely); 2,4-15,17 (all partially). Inventions searched:  
#1 (SEQ ID NOs 2789/2790), #2 (1/2), #222 (441/442), #246 (489/490), #602 (1201/1202), #729 (1455/1456), #874 (1745/1746), #1397 (2791/2792)
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**Remark on Protest**

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

original patent family members

International Application No

99/09346

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0818465	A	14-01-1998	EP 0917582 A	26-05-1999
			WO 9802560 A	22-01-1998
WO 9629412	A	26-09-1996	AU 716225 B	24-02-2000
			AU 4934396 A	08-10-1996
			BR 9607651 A	17-11-1998
			CA 2215161 A	26-09-1996
			CZ 9702914 A	14-01-1998
			EP 0815234 A	07-01-1998
			HU 9702387 A	28-05-1998
			JP 11500624 T	19-01-1999
			NO 974264 A	13-11-1997
			PL 322363 A	19-01-1998
			SI 9620035 A	31-12-1998
			SK 125597 A	03-06-1998
WO 9408013	A	14-04-1994	AU 5403594 A	26-04-1994
WO 9213871	A	20-08-1992	AU 1411492 A	07-09-1992
			US 5834591 A	10-11-1998
WO 9601901	A	25-01-1996	FR 2722210 A	12-01-1996
			AP 562 A	20-11-1996
			AU 712397 B	04-11-1999
			AU 2891295 A	09-02-1996
			BR 9508714 A	02-06-1998
			CA 2193130 A	25-01-1996
			CN 1152338 A	18-06-1997
			CZ 9700052 A	14-05-1997
			EP 0770132 A	02-05-1997
			HU 77341 A	30-03-1998
			JP 10502532 T	10-03-1998
			NO 970047 A	07-01-1997
			NZ 289153 A	25-02-1999
			PL 318193 A	26-05-1997
			SK 597 A	06-08-1997
			TR 960040 A	21-06-1996
			ZA 9505688 A	26-02-1996
WO 9737044	A	09-10-1997	AU 2598497 A	22-10-1997
			BR 9708456 A	03-08-1999
			CA 2248985 A	09-10-1997
			CN 1220703 A	23-06-1999
			CZ 9802976 A	17-02-1999
			EP 0901530 A	17-03-1999
			JP 2000501621 T	15-02-2000
			NO 984517 A	25-11-1998
			PL 329045 A	01-03-1999
			SK 130598 A	11-06-1999
WO 9633276	A	24-10-1996	AU 5552396 A	07-11-1996
			CA 2218741 A	24-10-1996
			EP 0821737 A	04-02-1998
			JP 11501520 T	09-02-1999
WO 9713860	A	17-04-1997	FR 2739624 A	11-04-1997
			AU 7221396 A	30-04-1997
			CA 2207302 A	17-04-1997



# INTERNATIONAL SEARCH REPORT

or on patent family members

In: International Application No

PCT/99/09346

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9713860 A		EP 0796332 A	24-09-1997
		HU 9801714 A	28-10-1998
		JP 11500630 T	19-01-1999
		NO 972314 A	18-07-1997
-----			